EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Joshua Povsner on October 14, 2010.

The application has been amended as follows:

Amendments to the Specification:

In the specification, the paragraph beginning on page 4, line 9, has been amended as follows:

To achieve the object, provided by the invention are,

~~as set forth in claim 1,~~ a bending apparatus which moves one of upper and lower tables 9, 10, and performs bending on a workpiece W with tools P, D attached to the upper and lower tables 9, 10, which comprises:

tool-layout information determination device for automatically or manually determining tool-layout information based on product information;

tool housing device A, A' for housing a tool group including a plurality of split tools;

tool exchanging device B, B' for exchanging tool groups between the tool housing device A, A', and the upper and lower tables 9, 10; and

process-station formation device C for splitting a tool group transferred from the tool housing device A, A' to the upper and lower tables 9, 10 through the tool exchanging device B,

B' into a plurality of tool groups based on the tool-layout information from the tool-layout information determination device, thereby forming a plurality of process stations (FIG. 1),

~~as set forth in claim 7,~~ a bending method in a bending apparatus which moves one of upper and lower tables 9, 10, and performs bending on a workpiece W with tools P, D attached to the upper and lower tables 9, 10,

forming a process station by isometric split tools based on automatically or manually determined tool-layout information, and then performing bending,

~~as set forth in claim 8,~~ a bending method in a bending apparatus which moves one of upper and lower tables 9, 10, and performs bending on a workpiece W with tools P, D attached to the upper and lower tables 9, 10,

forming a plurality of process station by transferring a tool group which comprises a plurality of split tools to upper and lower tables 9, 10, splitting the transferred tool group into a plurality of tool groups based on automatically or manually determined tool-layout information, and then performing bending, and

~~as set forth in claim 11,~~ a bending tool in a bending apparatus which moves one of upper and lower tables 9, 10, and performs bending on a workpiece W with tools attached to the upper and lower tables 9, 10,

provided with a groove 55 with which tool moving and positioning device R for moving and positioning the bending tool in a longitudinal direction (X-axial direction) of the upper and lower tables can be engaged (FIG. 32).

In the specification, the paragraph beginning on page 5, line 14, has been amended as follows:

According to the structure of the invention, ~~as set forth in claim 1 (7, 8, and 11)~~ a predetermined number N (for example, 250) of tools having the same shape (for example, straight sword type) and the same length (for example, 5 mm) defines one mold group, and a plurality of tool groups G1 to G4, G1' to G4' are housed, desired tool groups G3, G3' (FIG. 16(A)), each comprising punches P and dies D selected from the plurality of tool groups, are transferred to upper and lower tables 9, 10 side, and when a process station is formed, for example, because a separator 60 (FIG. 14) sorts and splits the tool groups into a plurality of tool groups g1 to g4, g1' to g4' with reference to the number of tools n1, n2, e.g., at each punches P side and dies D side, and positions them at predetermined positions (FIG. 16(D)), the number of tools with the same length does not lack, and creation of a tool layout with reference to the number of tools facilitates building a plurality of process stations for different processes, and this makes it possible to cope with step bending easily and rapidly.

In the specification, the paragraph beginning on page 6, line 2, has been amended as follows:

According to the structure of the invention ~~as set forth in claim 1 (8, 11)~~, since a tool E1 (FIG. 26(A)) comprising a plurality of spilt tools P with different shapes (for example, straight-sword type, goose-neck type), and different lengths (for example, 5 mm, 30 mm, and 50 mm) are housed, in a case where a process station is determined to cope with step bending easily and rapidly for a product particularly requiring a quality, a tool having a length close to the length of

the process station is preferentially selected, and the process station with that length is constituted by less split tools as much as possible, thereby preventing formation of a scratch in a workpiece at the time of bending.

In the specification, the paragraph beginning on page 6, line 11, has been amended as follows:

According to the structure of the invention ~~as set forth in claim 1~~, because the plurality of tool groups G1 to G4, G1' to G4' are housed in multiple racks on the rear faces of the upper and lower tables 9, 10 (for example, first racks 22, 23 to fourth racks 28, 29 provided up and down (in Z-axial direction) of the rear face of the upper table 9 in FIG. 8) at each punches P side (FIG. 1) and dies D side, it is possible to save a tool housing space.

In the specification, the paragraph beginning on page 6, line 17, has been amended as follows:

Further, according to the structure of the invention ~~as set forth in claim 1 (11)~~, formation of a tool group by split tools all having lengths of 5 mm (FIG. 81, FIG. 32) makes it possible to cope with various bending lengths without using a lacking 15 mm split tool, resulting in rapid building of the plurality of process stations, and in view of this point, it is possible to cope with step bending easily and rapidly.

In the specification on page 27, line 22, "FIG. 25(S)" has been changed to --FIG. 25(D)--

Amendments to the Claims:

1 (Currently Amended). A bending apparatus which moves one of upper and lower tables, and performs bending on a workpiece with tools attached to said upper and lower tables, said upper and lower tables having a longitudinal axis, the bending apparatus comprising:

a tool-layout information determination device for automatically or manually determining tool-layout information based on product information;

a tool housing device for housing tool holders each for holding a tool group including a plurality of split tools;

a tool exchanging device for exchanging the tool holders with their tool groups of the split tools between said tool housing device, and said upper and lower tables, the dimension of the tool holders extending in the longitudinal direction of the tables being less than the longitudinal dimension of the tables; and

a process-station formation device for splitting a tool group transferred from said tool housing device to said upper and lower tables through said tool exchanging device into a plurality of tool groups based on said tool-layout information from said tool-layout information determination device, thereby forming a plurality of process stations, the process-station formation device being capable of moving ones of the split tools, that were transferred to said upper and lower tables, in the longitudinal direction of the tables to positions on the upper or lower tables not in the tool holders.

2 (Original). The bending apparatus according to claim 1, wherein all of said plurality of split tools have the same length.

3 (Original). The bending apparatus according to claim 2, wherein all of said plurality of split tools have a length of 5 mm.

4 (Currently Amended). The bending apparatus according to claim 1, wherein a combination and layout of the split tools necessary for forming the process stations predetermined based on the product information are formed in [[a]] one of the tool holders of said tool housing device.

5 (Currently Amended). The bending apparatus according to claim 4, wherein said combination and layout of the split tools necessary for forming the process stations are automatically or manually determined.

6 (Currently Amended). The bending apparatus according to claim 1, wherein said tool housing device is constituted by multistage racks mounted up and down on [[the]] a rear face of said upper and lower tables, and said multistage racks house said plurality of split tools, for each tool holder.

7 (Original). The bending apparatus according to claim 1, wherein said tool exchanging device is constituted by holder hold members for holding a tool holder, and said holder hold members are movable frontward, backward, upward and downward between said tool housing device and said upper and lower tables.

8 (Original). The bending apparatus according to claim 1, wherein said process-station formation device comprises a separator, and said separator is movable rightward, leftward, frontward, backward, upward and downward.

9 (Original). The bending apparatus according to claim 8, wherein said separator has an arm which is rotatably mounted on an abutment of a back gauge.

10 (Original). The bending apparatus according to claim 1, wherein said process-station formation device comprises a fork-like separator, and said fork-like separator has a pair of taper claws.

11 (Currently Amended). The bending apparatus according to claim 1, wherein the exchangeable tool holders are freely attachable and detachable ~~attachable/detachable~~ tool holders that are mounted to the center of said upper and lower tables, to whose both sides fixed tool holders are mounted, and holder clamp members for fixing said freely attachable and detachable ~~attachable/detachable~~ tool holders are mounted in the center said upper and lower tables.

12 (Currently Amended). The bending apparatus according to claim [[1]] 11, wherein tool clamp members for supporting and fixing the desired tool group are mounted in said freely ~~attachable/detachable~~ attachable and detachable tool holders and said fixed tool holders.

Non-elected claims 13-20 have been canceled.

2. The following changes to the drawings have been approved by the examiner and agreed upon by applicant: A reference character "37" with a lead line leading to the ball screw shown in Figure 4 have been added to Figure 4 (in accordance with page 13, lines 5-7 of the specification, for example). The text "Prior Art" has been added to both Figures 33 and 34 (in accordance with at least page 9, lines 1-4 of the specification, for example). In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

3. The following is an examiner's statement of reasons for allowance:

U.S. Pat. No. 5,168,745 to Miyagawa et al. teaches that a die/punch 13 in the form of divisional die combo 13a, standard length die 49, and divisional length die combo 13b (see Figures 35-36), which overall die/punch 13 includes subholders 12c, is inserted into overall

cartridge holder 12 (see Figures 1, 4, 20-21, for example), and then all that structure (i.e., 12+overall 13) are inserted into or removed from press brake 1 via die exchange apparatus 16/15 at position P2 (shown in Figure 2).

Specifically, the magazine 31 (i.e., "tool housing device") at the right (re Figure 1) side of the press brake 1 includes two side-by-side chain portions 36, 37. Chain portion 36 holds the standard dies 49. Chain portion 37 holds the divisional dies 50. Chain portion 37 is shown in detail in Figure 4, and includes two types of die support units: divisional die support units 46, and combination die support units 47. The 46's hold a bunch of divisional dies 50 by themselves (i.e., one 46 holds multiple 50's without holding their subholders 12c; see Figure 5, for example).

Provided adjacent to the chain portion 37 is a divisional die selection station 51 (see Figures 1, 2, 5, and 6) having carriage 55 and guide rails 52, for example.

When the controller figures out what die configuration and length is needed for a particular workpiece (see at least col. 9, lines 36-52, for example), the chain 37 is fed so that a divisional die support unit 46 holding some divisional dies 50 that are desired to be used is located at position P1 next to the divisional die selection station 51. Appropriate clamping/unclamping and movement of carriage 55 occurs such that only the dies 50 held by the 46 that are desired to be used are transferred to the carriage 55.

Then, the chain 37 is again indexed, until a combination die support unit 47 is positioned next to the divisional die selection. Appropriate clamping/unclamping and movement of the carriage 55 occurs such that the dies 50 held by 55 (that were just removed from a 46) are transferred into a subholder 12c of the combination die support unit 47. This process was described in detail re the formation of the partial upper die 13a, shown in Figure 35 (see col. 6,

line 28, through col. 8, line 14, as well as col. 10, lines 22 through col. 13, line 37, for example), and Miyagawa teaches that the same process is then used to create/provide the other partial upper die 13b to another 47 of the chain 37 (see at least col. 13, lines 36-43, for example).

Appropriate indexing of the chain magazine 37 occurs to place the partial upper die 13a (including its subholder 12c) into a position (towards the left of Figure 2) wherein it can be inserted into a holder/cartridge 12 held by die exchange apparatus 16 via the use of die transfer device 60 (which includes transfer chain 65, best shown in Figures 3 and 17). This occurs by pushing the partial upper die 13a with its subholders 12c from right to left re Figure 1 through an empty slot of the chain magazine portion 36 and into a holder 12 in the die exchange apparatus 16 (16 shown in detail in Figure 4; see col. 13, line 56 through col. 16, line 19, for example).

After partial upper die 13a is pushed into the tool holder 12 within the die exchange apparatus 16, then the chain magazine portion 36 is indexed to put the desired standard length die 49 into a position wherein 60 can then transfer 49 into the holder 12 held by the die exchanger 16 in a position next to partial die 13a (see Figures 35-36, noting that a first partial upper die 13a is assembled from a bunch of smaller dies as just described, inserted into holder 12, then die 49 is inserted into 12 next to 13a, and then a further partial die 13b is formed with actions like those used to form 13a as described above, and inserted into 12 next to 49/13, as shown in Figure 36). See also col. 16, lines 17-68, as well as col. 17, lines 1-45).

Then, chain magazine portion 37 is indexed to put the partial upper die 13b into a position wherein 60 can then transfer 13b into the holder 12 held by the die exchanger 16 in a position next to 13a and 49 (as just described).

Then die exchanger 16 (shown in Figure 4, i.e., the "tool exchanging device") is utilized to provide the whole tool holder 12, including the dies 13a, 49, and 13b (just described) and their subholders 12c (Figures 35-36 and see also Figure 20 for a clear view re the subholder), into the ram 5 (i.e., upper table) of the press brake or bending apparatus 1. Miyagawa additionally teaches that a similar process is used for the bottom portion 3 of the press brake 1 (see col. 17, line 46 through col. 18, line 1, for example).

However, Miyagawa does not teach any "process station formation device for splitting a tool group transferred from said tool housing device to said upper and lower tables through said tool exchanging device into a plurality of tool groups based on said tool-layout information from said tool-layout information determination device, thereby forming a plurality of process stations, the process-station formation device being capable of moving ones of the split tools, that were transferred to said upper and lower tables, in the longitudinal direction of the tables to positions on the upper or lower tables not in the tool holders" as set forth in independent claim 1.

JP-7-100540, for example, teaches a splitter device 10 and/or 11 for splitting split tools mounted in the press brake into various groups, which splitter device is mounted to a face of the ram 8 (i.e., "upper table" of the bending apparatus). See, for example, Figures 3-5 and 7.

As noted by the English abstract, the splitter device shown in Figures 4-5 and 7 (which moves in the right/left direction re Figures 4-5 and 7 to thus split the tools into groups as particularly shown in Figure 7) serves to facilitate the easy changing of the length of the bending dies used.

However, even assuming *arguendo* that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the splitter (i.e., the

"process-station formation device") taught by JP '540 to the bending press arrangement taught by Miyagawa for the purpose of facilitating the easy change of die length, as taught by JP '540, the present invention as set forth in independent claim 1 would still not result, noting that in the Miyagawa reference, the tool holders 12 that hold the tool groups including a plurality of the split tools (described previously) do not have a "dimension ...extending in the longitudinal direction of the tables" that is "less than the longitudinal dimension of the tables", and there is no structure or configuration or teaching provided in either Miyagawa or JP '540 that would motivate one of ordinary skill in the art to provide a configuration wherein the length of the tool holder 12 was less than the length of the upper and lower tables of the bending press, nor any configuration or structure that would permit the process-station formation device taught by JP '540 to be "capable of moving ones of the split tools, that were transferred to said upper and lower tables, in the longitudinal direction of the tables to positions on the upper or lower tables not in the tool holders" as set forth in independent claim 1.

In contrast, note that the provision of the process-station formation device taught by JP '540 to the bending press arrangement taught by Miyagawa would result in a process-station formation device that was able to move the split bending tools into various configurations within the tool holder 12, but that there is no structure or configuration, such as any location on the upper and lower tables in the Miyagawa press to one or both of the right or left of the ends of the tool holder 12 that has structure aligned with that of the holding portion of tool holder 12 for receiving a split punch or die from 12. In other words, even assuming *arguendo* that a shorter length of tool holder 12 was provided to the bending press of the Miyagawa reference, unless some further modification (for which there is no teaching absent impermissible hindsight) was

provided to the Miyagawa press, the Miyagawa device, even in combination with JP '540, would not be capable of functioning as claimed, noting that moving a tool 13 to the left or right (i.e., in the length direction of 12) to a point beyond the end of 12 would not result in a workable device, since there is no corresponding holding structure on the upper and lower tables (5, 3, respectively) that is aligned with the holding structure within the tool holders 12 (which holds the punches/dies) for receiving the moved punches or dies, i.e., moving the punches or dies (that were transferred to the table of the press) to the right or left beyond the end of a shorter tool holder 12 would, at best, result in the punch or die moved to such a position loosely falling or dropping from the end of tool holder 12, since the upper 5 and lower 3 tables are configured with holding structure that has a space for receiving the tool holder 12 (or the corresponding holder re the bottom; see Figure 20), which tool holder 12 has a cross sectional area that is larger than, is also of a slightly different shape than, and is at a location vertically spaced from, either the subholders 12c or tools 13, as shown in, for example, Figure 20. See also Figure 1.

Thus, the device taught by the combination of Miyagawa and JP '540 would not result in an arrangement wherein the process station formation device taught by JP '540 and bending press taught by Miyagawa are structured and configured so as to be capable of "splitting a tool group transferred from said tool housing device to said upper and lower tables through said tool exchanging device into a plurality of tool groups based on said tool-layout information from said tool-layout information determination device, thereby forming a plurality of process stations, the process-station formation device being capable of moving ones of the split tools, that were transferred to said upper and lower tables, in the longitudinal direction of the tables **to positions on the upper or lower tables not in the tool holders**" as set forth in independent claim 1.

While not reading limitations into the claims from the present specification, purely for the purposes of a better understanding of the nuances of the present claim language vs. the structure present in the described prior art, note that the described Miyagawa and JP '540 configuration is different than in the present invention, wherein re the claimed capability of the process-station formation device to be able to so split the transferred tool groups as claimed and to be capable of moving ones of the split tools P that were transferred to the upper table, for example, in the longitudinal direction (X) of the table to positions on the upper table not in the exchanged tool holders, the bending press of the present invention is configured so that the exchanged tool holder, such as 1 (see Figure 13; note that tool holder 1 has a length dimension in the longitudinal X direction of the tables that is shorter than the longitudinal dimension of the tables in that X direction), holding plural tools P, is aligned with other correspondingly arranged tool holders 2, 3 on the press, such that punches P can be moved in the longitudinal X direction by the process-station formation device from the tool holder 1 to a position (within holders 2 or 3 on the table of the press, for example) not in the exchanged or transferred tool holder 1, for example. See present Figures 1, 13, and 17, for example. Miyagawa in view of JP '540 lacks any structure of any kind that would so permit the device to function as claimed to enable the process-station formation device taught by JP '540 to move any transferred split tools in the Miyagawa bending press "in the longitudinal direction of the tables to positions on the upper or lower tables not in the tool holders" as set forth in claim 1.

Also, there is no combinable teaching in the prior art of record that would, reasonably and absent impermissible hindsight, motivate one having ordinary skill in the art to so modify the teachings of Miyagawa and/or JP '540, and thus, for at least the foregoing reasoning, Miyagawa

and/or JP '540 does/do not render obvious the present invention as set forth in independent claim 1.

The aforedescribed prior art being representative of the closest prior art of record, for at least the foregoing reasoning, the prior art of record neither anticipates nor renders obvious the present invention as set forth in independent claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Comment re Rejoinder of withdrawn Claim 10

4. Claim 1 is allowable. The election of species requirement, as set forth in the Office action mailed on February 18, 2010, has been reconsidered in view of the allowability of claim 1 to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Thus, previously withdrawn claim 10, directed to the species with the "fork-like separator", is no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim.

In view of the above noted withdrawal of certain portions of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica E. Cadugan whose telephone number is (571) 272-4474. The examiner can normally be reached on Monday-Thursday, 5:30 a.m. to 4:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Erica E Cadugan/
Primary Examiner
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eec
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